

REMARKS/ARGUMENTS

Claims 1-7 are pending.

Claims 1 and 6-7 have been amended.

Support for the amendment is found in the claims and specification, as originally filed. Specifically, support for the amendment of claims 1 and 6-7 can be found, for example, at the Examples on pages 8-10.

Applicants thank the Examiner for indicating the allowable subject matter of Claim 7. Applicants address the objection of Claim 7 by rewriting the claim in an independent form.

The rejection of Claims 1-3 and 5-6 are rejected to under 35 U.S.C. § 102(b) over Zhang, The Plant Cell, 5:403-418 (1993) because Zhang does not disclose germinating and growing the seeds and obtaining an orchid haploid.

The claimed method is directed to constructing an orchid haploid based on parthenogenesis. The method comprises dropping an auxin solution to unfertilized orchid flowers, germinating and growing the seeds and obtaining the orchid haploid. Claim 2 limits dropping of auxin to 30 days after blooming. Claim 4 requires a concentration of auxin to be between 0.1 and 5%. Claim 6 further requires pollinating with an auxin solution forming seeds based on parthenogenesis, germinating the seeds, judging plants grown from the germinated seeds for being haploid, selecting the haploid plants, and growing the haploid plants. Claim 7 requires judging as haploid plants by measuring DNA content or the number of chromosomes of samples obtained within a period of one to five months after germination.

Zhang investigates the effect of pollination on ovary development in orchids (abstract). Zhang describes that only a few comprehensive studies of ovule development have been conducted and in only a few orchid genera (page 415, left col., second paragraph). Zhang describes the role of auxin in promoting ovary development after pollination (page 404, left col.). Zhang further describes that many studies have demonstrated that application of auxins

to the orchid stigma *partially* substitutes for pollination in inducing the post-pollination syndrome in orchid flowers (page 404, left column, second full paragraph).

On page 414 in the first paragraph, Zhang describes that auxin alone can initiate hair cell growth and cell division after 4 days, demonstrating the effect of auxin in initiating ovary development. However, Zhang states that an assessment at a later time period (at 10 days) *was not possible* because auxin treated flower *aborted* before then (page 414, end of the top paragraph).

Further, Zhang describes experiments by Strauss (1982), wherein Strauss applied  $^{14}\text{C}$  label auxin to the stigmas of orchid flowers, wherein by 24 and 72 hours following the treatment, radioactivity could be detected in flowers, implicating auxin as a candidate for a pollination factor (page 415, right column, second full paragraph). Zhang describes determining the effect of auxin on hair cell growth after 48 hours (page 415, right column, second full paragraph). Zhang states that with NAA application alone, the ovary develops for a period of 4 to 5 days prior to *abortion of the entire flower*. Zhang continues that this phenomena probably is due to the exhaustion of the transported supply of NAA from the stigma. Zhang points out that under natural conditions, pollen and growing pollen tubes continuously supply auxin to the ovary, allowing the ovary to develop into a mature fruit (page 415, right column, second full paragraph).

Thus, Zhang only describes monitoring the effect of auxin during a very short time after pollination because after 4 or 5 days the entire flower aborts. If one time application leads to abortion of the flowers, then forming seeds which can be used for obtaining grown haploid orchids is not possible under this experimental condition, and only possible when auxin is supplied continuously under natural conditions. Therefore, Zhang does not describe a method of constructing an orchid haploid comprising forming seeds based on parthenogenesis, germinating the seeds, and growing the seeds to obtain orchid haploid.

Further, Zhang does not disclose that a pollination with auxin is conducted after 30 days after blooming and that the concentration of auxin solution is between 0.1 to 5%. The paragraph bridging pages 3 and 4 of the specification discloses that unless a moderate concentration of auxin is applied, an unfertilized ovary will fall and then seeds cannot be obtained. This is because the high concentration of auxin will induce a generation of ethylene and make fruits fall off plants.

An actual objective of Zhang's study is investigating the role of ethylene in food ripening. Zhang discloses that most reports attribute the growth response of ovaries to the direct effect of auxin or possibly the indirect effect because auxin stimulates ethylene production (page 404, left column). Therefore, Zhang does not concern growing seeds and mature orchid haploids (and therefore, concentration of auxin) but he only concerns the role of ethylene in food ripening.

Zhang teaches away from the claimed method which describes dropping auxin, forming seeds, and growing mature orchid haploid plants because Zhang discloses that after treatment with auxin assessment of ovary development at a later point after pollination *was not possible* because auxin treated flowers aborted before then.

With regard to Claim 6, Zhang does not teach germinating seeds, judging the plants growing from the germinated seeds for being haploid, selecting the haploid plants, and growing the haploid plants.

Zhang discloses applying auxin to the orchid stigma for *partial* substitution for pollination in inducing the postpollination syndrome in orchid flowers (page 404, left col, second full paragraph). Zhang further discloses that auxin stimulates ethylene production in orchid plants and that flowers abort after 4-5 days after pollination with auxin, which does not allow an assessment of ovary development at a later time (page 414, left col., top paragraph). Therefore, Zhang does not anticipate Claim 6.

Applicants request the rejection be withdrawn.

Claim 4 is rejected under 35 U.S.C. § 103 over Zhang. The Examiner alleges that although Zhang does not teach using the concentration of auxin solution between 0.1 to 5%, Zhang clearly teaches the step of constructing an orchid haploid by application of an auxin and, therefore, it is obvious to choose a concentration of auxin experimentally for obtaining orchid flowers.

As set forth above, Zhang does not disclose a method of constructing an orchid haploid comprising forming a seed, germinating the seed, and growing a haploid orchid. Therefore, even if adjusting the concentration of auxin may be experimentally possible, as alleged by the Examiner, Zhang still does not disclose the claimed method. Applicants request the rejection be withdrawn.

A Notice of Allowance for all pending claims is requested.

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